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Fauna of Karabakh and liberated territories and prospects of reintroduction of some largest mammals

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The article clarifies the fauna of Karabakh and the liberated territories and the reintroduction of some large mammals to historical sites on the basis of available literature. Based on the literature data, 56 species of insect fauna in Karabakh and the liberated territories are rare, endemic and endangered. Of the 53 species and subspecies of fish found in the water basins of the Azerbaijani part of the Lesser Caucasus, 7 species are included in the Red Data Book of Azerbaijan (2013), and 4 species are included in the IUSN Red List. 4 out of 11 species of amphibians belonging to the batrachafauna of Azerbaijan and 35 out of 63 species of reptiles belonging to the herpetofauna are found in these areas. Of the 367 species of birds that existed in Azerbaijan before the occupation, 200 species were found in these areas (Currently, Azerbaijan's ornithofauna consists of 407 species of birds.). At present, 115 species of mammals have been registered in Azerbaijan. Before the occupation, 75 mammal species belonging to 6 orders were registered in the territory of Karabakh. Before the occupation, 24 species were included in the "Red Book" of Azerbaijan (2013). In the liberated areas, it is possible to begin the recovery of the population of some of the species of several largest mammals that have recently become extinct (Gazelle - *Gazella subgutturosa* Guldenstaedt, 1778, Caucasian noble deer - *Cervus elaphus* Ogilbu, 1870, Chamois - *Rupicapra rupicapra* Linnaeus, 1758). Historical conditions have been created for the study of the liberated territories and the reintroduction of the listed populations to their historical areas: territories of Aghdam, Fizuli, Jabrayil, Zangilan, where gazelle possibly exists, Caucasian red deer can be found in the territories of Kalbajar, Lachin, Gubadli and Zangilan districts, chamois in the Murovdag range.

Keywords: *Azerbaijan, Karabakh, fauna, fish, amphibians, reptiles, birds, mammals, reintroduction, Red Book*

INTRODUCTION

Karabakh, the charming corner of Azerbaijan and its surrounding regions, has always been distinguished by its natural conditions, sharply different from other regions of Azerbaijan, by the richness of its fauna diversity. The territory of Karabakh makes up 1/6 of the total territory of the republic (plain, mountainous and high mountainous). The territory of Karabakh is one of the richest territories of our republic due to its fauna diversity. Along with the destruction of cultural monuments in the occupied territories of Azerbaijan by the Republic of Armenia, as a result of long-term, targeted environmental terror, the habitats of animals in Karabakh were destroyed, their populations were killed, these areas became dead zone. As a result of successful counter-offensive operations launched by the Azerbaijani Army against the occupying Armenian armed forces on September 27, 2020, under the leadership of President, Supreme Commander-in-Chief Ilham Aliyev, our occupied lands were liberated for 44 days. The measures taken by the state in Karabakh will create conditions for the restoration of natural ecosystems in

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the occupied territories and the sustainable development of historically formed biodiversity in the region. Urgent systematic scientific research should be launched to assess the current ecological condition of our fauna in the liberated Karabakh and surrounding areas. The purpose of the article is to clarify the reintroduction of some largest mammals to their historical habitats on the basis of literature data on the fauna of Karabakh and the liberated territories.

MATERIALS AND METHODS

Existing literature information was used in writing the article.

RESULTS AND DISCUSSION

The richness of the vegetation of Karabakh and the liberated territories, the wide diversity of landscape and biotope features affect the richness of the fauna. 53 species and subspecies of fish are distributed in the water basins of the Azerbaijani part of the Lesser Caucasus, of which 7 species are included in the "Red Book" of Azerbaijan (2013), and 4 species are included in the Red List of IUSN. Karabakh and the liberated territories are rich in reservoirs (rivers, lakes, reservoirs, springs, etc.). The ecological terror inflicted on our nature for almost 30 years has also affected the fish fauna formed here for many years. It should be noted that the ichthyofauna of these areas is very poorly studied. The ichthyofauna of the Hakari rivers, one of the largest rivers in the liberated territories, was studied in the 60s of the last century by Y.Abdurrahmanov (1966) and the ichthyofauna of Basitchay and Oxchuchay in the 70s by Mamedova, Nasirov (1975). The author determined that 12 species of fish are distributed in the Hakari River and 13 species of fish in the Basitchay and Oxchuchay rivers. At present, research should be launched to obtain accurate information on the ichthyofauna of water bodies in Karabakh and the liberated territories. The herpetofauna of the area has been studied by researchers in different years (Алиев, 1975; Алекперов, 1966; Ахмедов, 1981; Джафарова, 1979, 1981, 1982). 4 out of 11 species of amphibians belonging to the batrachafauna of Azerbaijan and 35 out of 62 species of reptiles belonging to the herpetofauna are registered in the area. One species of amphibians found in the Lesser Caucasus and adjacent foothills of Azerbaijan is included in the Red List of IUCN, and 6 species of reptiles are included in the IUCN and the Red Book of Azerbaijan (2013). The fauna of the Lesser Caucasus was richer than that of other groups of animals. Of the 367 species of birds that existed in Azerbaijan before the occupation (currently 407 species are found in Azerbaijan), 200 species were found in this area. 23% of these species are included in the Red Data Book of Azerbaijan (2013) with various protection statuses. At present, 115 species of mammals have been registered in Azerbaijan. Before the occupation, 24 species out of 75 mammal species belonging to 6 groups in the territory of Karabakh were included in the “Red Book” of Azerbaijan (2013). Elimination of damage to our fauna as a result of the occupation, restoration or reintroduction of destroyed fauna species should be the focus of attention. It will take a long time for large mammalian populations to recover. Although the decline has been recorded among mammals, birds and fish over the past period, the most dangerous situation is with mammals. From the first half of the twentieth century until 1959, research on even-toed ungulates belonged to N.Vereschagin (Vereschagin, 1937, 1939, 1940, 1951, 1959). Research in this direction was continued by M.Safarov in the following years (Сафаров, 1961). In the 60s of the last century, Alakbarov in his monograph "Mammals of South-West Azerbaijan" gave general information about the distribution and a number of ecological features of gazelles, roe deer, wild boar and bezoar goats (Алекперов, 1966). Currently, the situation in Karabakh and the liberated territories of the Lesser Caucasus has reached a crisis point. Rare, scientifically and economically valuable species, such as bezoar goats, roe deer and wild boar, are likely to be completely extinct. *Gazella subgutturosa* Güldenstaedt, 1780 is considered the least common species in the mammal fauna which has a very light slender body structure, jida height 60-80 cm body length 90-115 cm, weighing 18-33 kg. In time, gazelles could be found in all plains and foothills of Azerbaijan. In the middle of the 20th century, gazelles were still found in the Ganja-Gazakh and Mil

plains (Vereshchagin, 1959; Alekperov, 1966; Guliyev, 1981; Guliyev, Asekrov, 2010, 2012; Guliyev, 1998, 2004, 2011, 2015). The main habitats of gazelles in the world are the desert and semi-desert regions of Iran, Afghanistan, West Pakistan, Southern Mongolia, Northwest China, Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan. In the South Caucasus, the specific historical and geographical areas where gazelles are distributed, cover the Kura-Araz lowland, along the Kura River to Tbilisi, and along the Araz River cover all lowlands and foothills (Dyukov, 1930; Flerov, 1935; Vereshagin, 1942; Dementev, 1945; Mambetjumaev, 1955; İshunin, 1956).

In the South Caucasus, the territory of Azerbaijan is considered to be a relatively most common area for this animal (Vereshagin, 1937; 1939; 1947). Based on the literature sources, gazelles were widespread in the Acinohur, Kurakchay valley, Eldar plain, Turt-Sarija, Karabakh, Mil, Mugan plains, Gobustan steppes until the 1940s, and their number began to decline sharply until the 1950s (Vereshagin, 1937; 1939; 1947; 1959). During the aerial survey in 1960-1961, a total of 131 gazelles were found in the above-mentioned areas (14.3 thousand km²) (Кузмин, Шадилов, Кулиев, 1985). In the Mugan Plain, the main densely populated area, gazelles have been completely eradicated. The main reason for this was the hunting of gazelles and the lack of any protection work. As a result of Guliyev's research, modern habitats were compared with the former habitats of gazelles (Guliev, 1998; Musaev, Guliyev, Guliyev, 2010; Guliyev, 2015) and their reintroduction was clarified (Fig. 1).

Currently, a successful program to restore the historical habitat of gazelles is being implemented in the country. The project "Protection, reintroduction, and restoration of historical habitats of gazelles in the territory of the Republic of Azerbaijan" has been launched in order to achieve the restoration of gazelles in new areas by releasing them to their existing historical habitats. To date, more than 300 animals have been released in 6 areas.

For the first time in Azerbaijan, gazelles were relocated to a number of potential reintroduction areas as a result of the application of an improved reintroduction method developed by scientists at the Institute of Zoology of the National Academy of Sciences (Guliyev, Askerov, 2011). New herds of gazelles released into the territory of Acinohur plain, Aggol, Absheron national parks, Gobustan plateau are increasing.

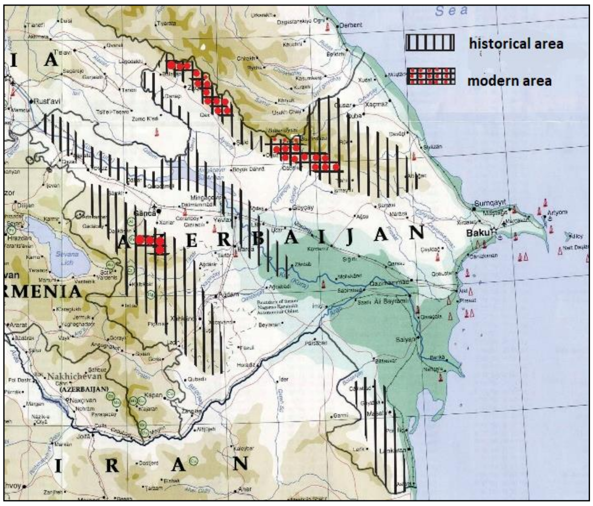


Fig. 1. Historical and modern habitat of gazelles in Azerbaijan (Guliyev, 2015)

The territories of Aghdam, Fizuli, Jabrayil, and Zangilan districts liberated from occupation should be studied for this purpose and, where possible, gazelle herds should be restored. Based on the literature sources, the range of deer or Caucasian deer (*Cervus elaphus* Ogilbu, 1870) in Azerbaijan consists of limited areas (Fig. 2) and is found in very few areas (Dementev, 1933; Aliyev, 1965).

The former area of deer in Azerbaijan covered all-mountain and plain forests and mountain meadows. Vereshagin reports that in the early twentieth century in the lower forest belts of Khachmaz, no more noble deer are found (Верещагин, 1959; Quliyev, 1998a; 2003b; 2008a; 2013v). In the upper forest belts of Gusar, this animal became extinct in the 80s of the XIX century. Until the end of the 19th century, noble deer was found in the reeds and tugai forests in the middle and lower reaches of the Kura River. The complete disappearance of the noble deer in Karabakh, in the Zayamchay valleys, and in the mountain forests of Shamkir dates back to the 1920s. According to Asadov, the areas of noble deer in Azerbaijan cover a very large area - the foothills of the Greater and Lesser Caucasus, the upper mountain forests, and the tugai forests of the Kur-Araz in the lowlands (Асадов, 1960). Deer have either left or been destroyed in the Karabakh region.

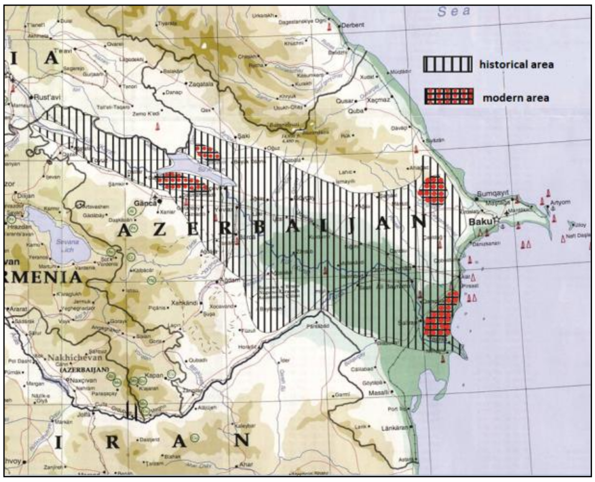


Fig. 2. Historical and modern habitat of deer (Guliyev, 2015)

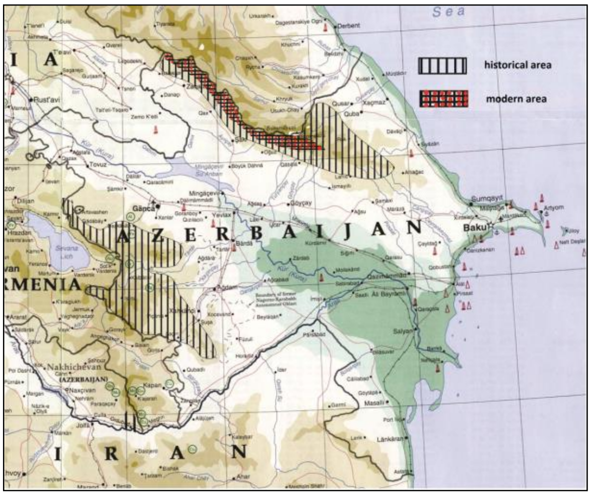


Fig. 3. The historical and modern habitat of the Caucasian Chamois in Azerbaijan (Guliyev, 2015)

Populations of Caucasian noble deer can be restored in the liberated Kalbajar, Lachin, Gubadli, and Zangilan regions. The modern range of Caucasian Chamois, (*Rupicapra rupicapra caucasica* L., 1758) populations is currently limited to the southern and northwestern slopes of the Greater Caucasus (Fig. 3).

According to Vereshagin's (1959) research, the historical range of this species also includes the Murovdagh and Shahdag ranges in the Lesser Caucasus.

They are found only in small numbers in the southern foothills of the Greater Caucasus Mountains in Azerbaijan (Guliyev, 1998a, 2007a, 2015). Caucasian Chamois are widespread in the mountainous and forested mountains, beginning in the western part of the Greater Caucasus and extending to the east. In time, they were found in large numbers in the coastal areas and river valleys of the upper reaches of the Katekhchay, Shinchay, and Turyanchay (Vereshagin, 1959).

By the end of the 19th century, this species is expected to be completely extinct in the Lesser Caucasus and in the upper reaches of the Zayam River (Vereshagin, 1942). At present, a small number of puppies have survived in these areas. The historical habitats inhabited by puppies in the territory of Azerbaijan have been suppressed due to changes in natural conditions and anthropogenic factors. The Caucasian Chamois remained in their historical habitats, only on the southern and northeastern slopes of the Greater Caucasus (Guliyev, 2015).

Asadov gives information about the area of the Caucasian Chamois in Azerbaijan and shows that this animal was in time in the Lesser Caucasus natural region of the republic in the late XIX and early XX centuries and that the Caucasian Chamois has already become extinct in that area (Asadov, 1960).

As it is known from literary sources, Caucasian Chamois lived in the natural regions of the Lesser Caucasus in the past. As it is known from literary sources, Caucasian Chamois lived in the natural regions of the Lesser Caucasus in the past. This roughly coincides with the Paleolithic period (Gadjiyev, 1977).

Now in the Lesser Caucasus, this animal is completely extinct (Guliyev, 2015). In the 30s of the XX century, Caucasian Chamois also existed in Karabakh, Shahdag range, and northwestern areas of Murovdag. Historical conditions have been created for the restoration of this species in the Murovdagh range. Animals can be obtained in the Zagatala reserve. The eastern foothills of the Murovdag range have the status of a strict protection regime by Goygol MP. Therefore, it is proposed to start a reintroduction project in the area first. Thus, it is possible to begin the restoration of the population of endangered mammal species mentioned in the recent past in the liberated areas

as soon as possible. Historical conditions have already been created for the reintroduction of these species to their historical habitats.

CONCLUSION

Due to the lack of accurate information about the existing fauna of Karabakh and surrounding areas, which have been under occupation for about 30 years, planned and long-term research should be started. Territories of liberated regions should be explored for gazelle (*Gazella subgutturosa* Guldenstaedt, 1778) in Aghdam, Fizuli, Jabrayil, Zangilan regions, Caucasian noble deer (*Cervus elaphus* Linnaeus) in Murovdag range.

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Qarabağ və işğaldan azad olunan ərazilərin faunası və bəzi iri məməli heyvanların reintroduksiyası perspektivləri

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Məqalədə mövcud ədəbiyyat məlumatları əsasında Qarbağ və işğaldan azad olunan ərazilərin faunası və bəzi iri məməli heyvanların tarixi areallarına reintrodukasiya məsələlərinə aydınlıq gətirilir. Ədəbiyyat məlumatları əsasında müəyyən edilmişdir ki, Qarabağ və işğaldan azad olunmuş ərazilərdə həşəratlar faunasının 56 növü nadir, endemik və nəsli kəsilmək təhlükəsində olan növlərdir. Kiçik Qafqazın Azərbaycan hissəsinin su hövzələrində təsadüf edilən 53 növ və yarımnöv balıqdan 7 növ Azərbaycanın "Qırmızı Kitab"ına (2013), 4 növ isə *İUSN*-in Qırmızı siyahısına daxil edilmişdir. Azərbaycanın batraxofaunasına aid 11 növ amfibilərdən 4-nə, herpetofaunasına aid 63 növ reptililərdən isə 35-nə bu ərazilərdə rast gəlinir. Azərbaycanın Kiçik Qafqaz və ona bitişik dağətəyi ərazilərində rast gəlinən amfibilərdən 1 növ IUCN-nin Qırmızı siyahısına, reptililərdən isə 6 növ IUCN-nin və Azərbaycanın "Qırmızı Kitab"ına (2013) daxil edilmişdir. Azərbaycanda işğala qədər mövcud olan 367 növ quşun (hazırda Azərbaycanın ornitofaunasını 407 quş növü təşkil edir) 200 növünə rast gəlinirdi. Hazırda Azərbaycan hüdudlarında 115 növ məməli növü qeydə alınmışdır. Qarabağ ərazisində işğala qədər 6 dəstəyə mənsub, 75 məməli növü qeydə alınmışdır. İşğala qədər 24 növ Azərbaycanın "Qırmızı Kitabı"na (2013) daxil edilmişdir. İşğaldan azad olmuş bölgələrdə yaxın keçmişdə nəsli kəsilmiş bir neçə iri məməli heyvan növünün bəzilərinin (Ceyran - *Gazella subgutturosa* Guldenstaedt, 1778, Qafqaz nəcib maralı - *Cervus elaphus* Ogilbu, 1870, köpgər - *Rupicapra rupicapra* Linnaeus, 1758) populyasiyasınının bərpasına ən qısa zamanda başlamaq mümkündür. İşğaldan azad olmuş Ağdam, Fizuli, Cəbrayıl, Zəngilan rayonlarının əraziləri bu məqsədlə tədqiq edilməli və mümkün yerlərdə ceyran, Kəlbəcər, Laçın, Qubadlı və Zəngilan rayonları ərazilərində Qafqaz nəcib maralının, Murovdağ silsiləsində köpgərin populyasiyalarının tarixi areallarına reintroduksiya edilməsi üçün artıq tarixi şərait yetişmişdir.

Açar sözlər: *Azərbaycan, Qarabağ, fauna, balıqlar, amfibilər, reptililər, quşlar, məməlilər, reintroduksiya, Qırmızı Kitab*

Животный мир Карабаха и территорий, освобожденных от оккупации и перспективы реинтродукции некоторых крупных млекопитающих

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В статье на основе доступной литературы вносится ясность в вопросах о фауне Карабаха и освобожденных территорий, а также реинтродукции в исторические местообитания некоторых крупных млекопитающих. Согласно литературным данным, 56 видов насекомых в Карабахе и на освобожденных территориях являются редкими, эндемичными и находящимися под угрозой исчезновения. Из 53 видов и подвидов рыб, обитающих в водоемах азербайджанской части Малого Кавказа, 7 видов занесены в Красную книгу Азербайджана (2013 г.), а 4 вида - в Красный список МСОП. На этих территориях также встречаются 4 из 11 видов земноводных, относящихся к батрахафауне и 35 из 63 видов рептилий, относящихся к герпетофауне Азербайджана. Из земноводных, обитающих на Малом Кавказе и прилегающих предгорьях Азербайджана, 1 вид внесен в Красный список МСОП. В

Красную книгу МСОП и Азербайджана внесены 6 видов рептилий (2013). До оккупации в Азербайджане орнитофауна была представлена 367 видами, число которых в настоящее время составляет 407, из них 200 видов обнаружены на исследуемой территории. На данный момент в Азербайджане отмечены 115 видов млекопитающих. До оккупации фауна Карабаха была представлена 75 видами млекопитающих, относящихся к 6 отрядам, из них 24 вида были занесены в «Красную книгу» Азербайджана (2013 г.). На освобожденных территориях можно начать восстановление популяции некоторых из недавно вымерших видов крупных млекопитающих (газель - *Gazella subgutturosa* Guldenstaedt, 1778, кавказский благородный олень - *Cervus elaphus* Ogilbu, 1870, серна - *Rupicapra rupicapra* Linnaeus, 1758). Для этого необходимо изучить освобожденные от оккупации территории Агдамского, Физулинского, Джебраильского и Зангиланского районов, по возможности, реинтродуцировать джейрана, газель и благородного оленя в исторические места их обитания – на территорию Кельбаджарского, Лачинского, Губадлинского и Зангиланского районов, а популяцию серны – на Муровдагский хребет, так как все объективные условия для этого уже есть.

Ключевые слова: *Азербайджан, Карабах, фауна, рыбы, амфибии, рептилии, птицы, млекопитающие, реинтродукция, Красная книга*